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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT
ABANDONED UNAVIDABLY UNDER 37 CFR 1.137(a)**

Docket Number (Optional)

First Named Inventor: JOHN C. SIMMONS

Art Unit: 3641

Application Number: 10/080,094

Examiner: STEPHEN JOHNSON

Filed: 2/21/02

Title: SAFER MUNITIONS WITH ENHANCED VELOCITY

Attention: Office of Petitions
Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

NOTE: If information or assistance is needed in completing this form, please contact
Petitions Information at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the Office notice or action plus any extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION.

NOTE: A grantable petition requires the following items:

- (1) Petition fee.
- (2) Reply and/or issue fee.
- (3) Terminal disclaimer with disclaimer fee-required for all utility and plant applications filed before June 8, 1995, and for all design applications; and
- (4) Adequate showing of the cause of unavoidable delay.

1. Petition fee

☒ Small entity - fee \$ 60 (37 CFR 1.17(l)). Applicant claims small entity status.
See 37 CFR 1.27.

☐ Other than small entity - fee \$ _____ (37 CFR 1.17(l)).

2. Reply and/or fee

A The reply and/or fee to the above-noted Office action in the form of _____ (identify the type of reply):

☐ has been filed previously on _____

☐ is enclosed herewith.

B The issue fee of \$ _____

08/10/2006 YPOLITE1 00000020 10000094

☐ has been filed previously on _____ 01 FC:1999

60.00 OF

☐ is enclosed herewith.

[Page 1 of 3]

This collection of information is required by 37 CFR 1.137(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED
UNAVOIDABLY UNDER 37 CFR 1.137(a)**

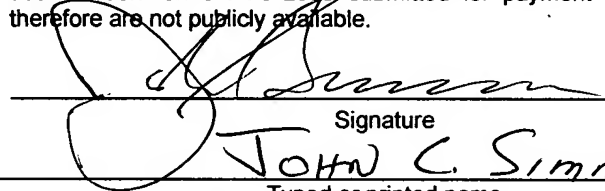
3. Terminal disclaimer with disclaimer fee

- ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ _____ for a small entity or \$ _____ for other than a small entity) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

4. An adequate showing of the cause of the delay, and that the entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition under 37 CFR 1.137(a) was unavoidable, is enclosed.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.



Signature
JOHN C. SIMMONS

Typed or printed name
7993 CAVERSHAMWOOD LN.

Address
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Address

8/2/06

Date

Registration Number, if applicable
901 754-9458

Telephone Number

- Enclosure ☒ Fee Payment
- ☐ Reply
- ☐ Terminal Disclaimer Form
- ☐ Additional sheets containing statements establishing unavoidable delay
- ☐ _____

CERTIFICATE OF MAILING OR TRANSMISSION (37 CFR 1.8(a))

I hereby certify that this correspondence is being:

☒ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to **Mail Stop Petition**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.

8/2/06

Date

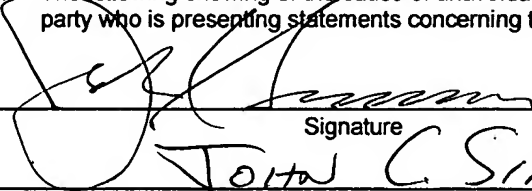


Signature
JOHN C. SIMMONS

Typed or printed name of person signing certificate

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED
UNAVOIDABLY UNDER 37 CFR 1.137(a)**

NOTE: The following showing of the cause of unavoidable delay must be signed by all applicants or by any other party who is presenting statements concerning the cause of delay.



Signature
John C. Simmons

Typed or printed name

8/2/06

Date

Registration Number, if applicable

(In the space provided below, please explain in detail the reasons for the delay in filing a proper reply.)

Applicant filed a prior petition for revival and attached the Petition forms along with fees (\$750, small entity). However, Applicant was not aware that the forms to the Petition Office needed to be accompanied by a response to the Examiner's office action. It appeared that sending the Examiner's response to the Petition Office with the petition for revival would be presumptuous until the petition was granted. I was mistaken.

As a result of that ignorance, the petition was denied without warning on May 2, 2006 and this petition is to request reconsideration of the petition.

The delay and cost to myself has been substantial and it was certainly not intentional being solely the result of my ignorance of the Petition process. The entire delay in filing the required reply was unintentional.

(Please attach additional sheets if additional space is needed.)



Application Number: 10/080,094

August 2, 2006

Applicant : John C. Simmons

Filed : February 21, 2002

Group Art Unit: 3641

Examiner : Stephen Johnson

RENEWED PETITION UNDER 37 CFR 1.137(b)

Mail Stop: PETITION

Commissioner for Patents

P.O. Box 1450

Alexandria VA 22313-1450

Applicant requests reconsideration of the petition.

History:

Applicant filed a prior petition for revival and attached the Petition forms along with fees (\$750, small entity). However, Applicant was not aware that the forms to the Petition Office needed to be accompanied by a response to the Examiner's office action. It appeared that sending the Examiner's response to the Petition Office with the petition for revival would be presumptuous until the petition was granted.

As a result of that ignorance, the petition was denied on May 2, 2006 and this petition is to request reconsideration of the petition. The applicable additional fees are attached (\$60) as is the response to the Examiner.

Certainly, considering the undesired delay and cost to myself and solely as a result of my ignorance of the Petition process, the entire delay in filing the required reply was unintentional.

Respectfully submitted,

John C. Simmons
(901) 754-9458



Application Number: 10/080,094

August 2, 2006

Applicant : John C. Simmons

Filed : February 21, 2002

Group Art Unit: 3641

Examiner : Stephen Johnson

Commissioner for Patents

P.O. Box 1450

Alexandria VA 22313-1450

Response to Office Action

For convenience, Applicant has used below the same paragraph numbering as used in the office action of 11/24/04.

1. Claim 10 and 14 are withdrawn per the action and will, instead, be included in a subsequent divisional.
2. The drawings have been corrected and attached. To accommodate the identifying numbers in the drawings, the suggested additions of those numbers to the description of the device (below) are suggested: (no other changes to specification)

Changes Under "BRIEF DESCRIPTION OF THE DRAWINGS:"

Fig. 4A illustrates the process of favorably leveraged conversion of final momentum at exit to additional velocity as the modified Sabot, 401, traveling in barrel, 402, collides with a fixed plug, 403, at the end of the muzzle forcing the diaphragm, 404, to move left thus compressing the fluid/gas/etc., 405, in the chamber to the left resulting in pressure adding further velocity to the projectile, 400.

Fig. 4B closes or reduces the size of the holes in the sliding stabilizer, 406, to create a shock absorber between the compression chamber and the impact to allow easy control of damping where necessary.

Fig. 4C illustrates a modified assembly accommodating the elimination of the sliding stabilizer and illustrates the optional in-barrel excess effluent escape channels, 407.

Fig. 4D additionally illustrates an assembly to prevent the recoil of the Sabot back into the barrel to support any form of later ejection means.

Fig. 4E illustrates one simple embodiment of an ejection means showing an optionally spring-loaded plug, 408, both for damping and to provide power for the subsequent rotation, 409, of the plug with captured Sabot.

3. a. Claim 11 has been amended to restrict the claim to hydraulic leverage to better reflect the narrower scope of the current elections required in an earlier office action.

The use of the term “hydraulic leverage” is very common in engineering since, in practical use, it is one of several often interchangeable forms of mechanical advantage. In claim 11 Applicant had used the term “leveraging means”, with the “means” identifying those forms of leveraging detailed in the specification, including, in substantial detail, hydraulic leverage. Claim 12, a subclaim to 11, had reflected the narrower scope required by the election (narrowed the form of leverage to hydraulics).

To respond to the action, Applicant has also, having already narrowed the scope in the parent claim 11, withdrawn Claim 12.

4. (quotation)

5. 13 has been modified to read:

”The device of claim 11 wherein:

the content of the hydraulic means is an explosive whose ignition is the result of the impact; whereby additional propulsion is achieved.”

Claim 12 has been withdrawn.

6. Claim 13. See 5 above.

7. (quotation)

8. Russell: (Underscoring below is Applicant’s)

- a. Russell is actually a patent about an innovative fuel injector, not a leverage-producing device (hydraulic or otherwise). Its purpose is to add fuel to the propulsion mix as the bullet proceeds down the muzzle (not at its terminus) so that the pressure doesn’t decrease near the end of the road. (Col. 1, Lines 19-30.)
- b. Applicant respectfully submits, although the action listed multiple similarities between the component parts of the two devices, that they have substantial differences both in functional design and purpose and certainly in application. Applicant, of course, concedes that, like any sabot, both have a projectile, a carrier and an acceleration means (so paragraphs 8, a-c in the office action aren’t discussed). However:
 - i. Re: paragraph (c): “acceleration means”:
Russell has only the primary acceleration means and nothing resembling the fully additive, potentially multiplicative complementary velocity acceleration at the muzzle. There is nothing in Russell to indicate that a secondary velocity jump at the muzzle was in any way anticipated.
 - ii. Re: paragraph (d): “an effectively anchored apparatus to reduce the speed of the projectile carrier”.
Russell does not have, as indicated in (d), an “apparatus to reduce the speed of the projectile carrier” (realizing that even this descriptive “snippet” is a significantly reduced statement of the current invention claim’s design, function and purpose). It could be argued that, in the process of the crushing of Russell’s sabot, its speed would be reduced but that is the detrimental side effect of the Russell process which adds

no velocity in the process. This is a fuel injector, not a hydraulic accelerator. The fuel does not push the projectile.

- iii. Re: paragraph (e): “leveraging means”
Russell does not have a leveraging means of any kind.
Further, Russell neither teaches nor anticipates the velocity multiplication of a mechanical advantage of any kind.

There is not even a mention of the words, “lever”, “hydraulics”, or “mechanical advantage” anywhere in the specification, drawings, or claims.

Also, the action indicated that item 16 (visible in Fig. 1) on the drawings was a leveraging means but 16 is described in Russell’s specification as the “liquid propellant” (clearly described as a fuel throughout the patent).

The action further indicated that item 34 (visible in Fig. 2) was also a leveraging means. However, it is described in Russell’s specification simply as a hole for the fuel to pass through (a port that “provides access for the fuel”) in Col 4 Lines 17-18.

- iv. Re: paragraph (f): “a moveable diaphragm or piston; and”
Russell has neither a moveable diaphragm nor a piston. Any indication in the drawings that might appear to be a pressure-creating diaphragm or piston can be cleared up by noting the specification’s descriptions thereof.

Also, though it is true that, of all the claims to which the action’s paragraph 8 refers, claim 12 does mention the phrase “diaphragm or piston”, it’s context is not reflected in the action’s comparison. What it actually says is:

“The leveraging means is hydraulic having a movable diaphragm or piston which impacts the anchored apparatus thus transmitting the energy as compression within a nearby chamber whose outlet impacts the rear of the projectile”. Russell neither teaches nor anticipates such components or functions.

- v. Re: paragraph (g): “fluid explosive in the compression chamber” is nowhere found or indicated in Russell. The only explosion in Russell is in the primary charge (ex: gunpowder). The “fluid” is a burned (an explosion, like the primary charge, requires containment as opposed to an already expanding media) not exploded and the burned, not exploded fuels (he suggests hydrogen peroxide with hydrazine in Col 5, Lines 10-11) do not burn in his chamber but after release from it. Russell is a patent for a fuel injector, not a leveraged hydraulic accelerator.

Although the above paragraphs address all the objections in paragraph 8 of the action, the following paragraphs further separate the two unrelated technologies:

- c. Both the coincidental liquid nature of the chamber's contents and the cosmetic similarity in line drawings between a rigid hydraulic compression chamber and a thin-walled made-to-be-easily-smushed "timed-release" fuel capsule is inconsequential.
- d. The compression of Russell's sabot teaches more of a time-released "squeeze out toothpaste" fuel injector than anything resembling an impact energy conversion. Russell's claimed acceleration occurs as the thus-metered fuel is gradually burned in the "combustion zone" (Col 1, Lines 15-17 and Col 1, Lines 71-72 through Col 2, Line 6) just posterior to the projectile as it makes the long journey towards the muzzle.

Ex: "..wherein the propellant is burned at the base of the projectile during part or even its entire progress through the gun bore (Col 2 , Lines 2-3), thereby to maintain (not even to increase, much less multiply -- Applicant's note) maximum effective pressure upon its base without loss due to acceleration and flow of the gas from the breech of the gun."

- e. Russell consists not of a mechanical advantage-based velocity multiplier but instead of a wedge shaped barrel that squeezes fuel out of a pouch. "That principle consists of the wedge action of the tapering bore on the deformable Sabot" (Col 1, Lines 23-25).
- f. Not only does Russell not teach hydraulics and impact-induced pressure increase, he specifically teaches that his device is dedicated to seeing that the pressure never changes. (Col 2 Lines 16-25) Ex: "..wherein the prepellant gas (not liquid – this is the result of the fuel's combustion not the liquid's pressure adding the propulsion: Applicant's insert) pressure is made to remain substantially constant...".
- g. The Sabot is not stopped nor is energy transferred. "..with a bore that tapers towards the muzzle to squeeze or extrude the propellant into the combustion zone behind the sabot and projectile as the two are shot out together" (Col 1, Lines 15-18) (still potentially killing allies). Ex: "...the totally collapsed sabot squeezes through the muzzle.." (Col 3, Lines 53-55).
- h. Russell's stated objective, design function, and only use is to keep the gas pressure in the barrel from decreasing as the projectile nears the muzzle (Col 1, Lines 30-35).
- i. Russell, though out for some time and requiring no license fees, is not used because the ideas it teaches don't work well and he neither teaches nor anticipates the current invention. Russell's taught design is not only contrary

to the smooth, unhindered, radially stable direct-energy transit of the current invention (Russell's inevitably crushed and warped sabot provides very poor control of the projectile) but also does not take into account the velocity loss or the barrel wear caused by the crush-based deformation of the Sabot.

9. (quotation)

10. Ashley: This is, as the patent title itself indicates, a "Liquid Propellant Weapon System" as opposed to a "Liquid Hydraulically Leveraged Weapons System. The liquid propellant is metered out in flight to be burned at a desirably smooth rate. It is not part of a hydraulic propulsion process where the liquid pushes the projectile. Ashley is also a fuel injector.

Like Russell, above, this fuel injector is unrelated to the current invention. The pictures of liquid chambers are, though they do hold liquids, completely unrelated to hydraulic force multiplication.

As Russell's "piston" moves towards the burner (as fuel is consumed shortening the chamber) the motion of the fluid itself, rather than hydraulically propelling the projectile, actually has a slightly opposite effect. It reduces the acceleration slightly. Fortunately, the true purpose of Russell, providing fuel that is evenly burned throughout the long path to the muzzle, easily overpowers this.

Neither the claims nor the specification refer, relate to, or in any way describe any hydraulically leveraged process.

Nor is there any mention of the word lever, mechanical advantage, or hydraulics anywhere in the specification or claims.

Applicant acknowledges, as with Russell, that the sabot has (a) a projectile, (b) a projectile carrier, and (c) an acceleration means (thus action notes 10 a-c are not discussed). However:

- a. Re: Paragraph (d): Ashley's nose shape (Col. 5, Lines 4-6), like most traditional sabots, allowed the sabot to separate in the wind after leaving the muzzle (which is how American servicemen or bystanders can currently be injured by friendly fire sabot fragments).
The current invention's sabot separation process
 - i. prevents these injuries and threats
 - ii. maintains control of the sabot
 - iii. uses an intentionally heavy sabot while Ashley is at the other end of the weight spectrum
 - iv. has multiple moving parts (Ashley's has no parts at all; just the rounded shape of the nose), and,

- v. rather than just flying apart in the wind as Ashley's randomly flung sabot does, converts the energy of the sabot into substantially multiplied velocity for the projectile (none of which Ashley in any way anticipates or teaches). Ashley's separation process actually slows down the projectile during separation.
 - vi. Also, the current invention's sabot separation isn't even a wind-based process. It is difficult to imagine someone seeing Ashley's and then, from that, drawing Fig. 4e.
- b. Re: Paragraph (e): "leveraging means".
- i. The action listed Ashley's part 14 (which can be seen in Fig. 1 and Fig. 2b) as a "leveraging means". Both pictures and the specification clearly indicate that it has nothing to do with any form of leveraging. It is a simple "pusher plate" (Col. 4, Lines 10-11).
 - ii. The action also listed Ashley's part 42 as a "leveraging means". However, in Col. 4, Lines 13-14, the Ashley's specification identifies it as an "injection volume" (a storage tank) where the fuel is stored for combustion "ready for firing" (not during firing – this is a flexible fuel injection tank not a hydraulic compression chamber). In the illustrations (such as Fig. 2b), it is seen as simply a chamber for that volume.
 - iii. The action lists Col. 3, Lines 54-68 as disclosing or suggesting a "leveraging means". However, that text simply relates to the frangible seals of a one-time event driven fuel injector. It is also described as being there to allow (after the breaking of the seals) combustion as the sabot makes the journey through the barrel.
 - iv. A study of all of the figures shows nothing that has anything to do with any of the many forms of leverage.
 - v. Ashley's device, like Russell's above, is another fuel injector device, not a leverage-based device be it hydraulic leverage or bar-lever delivered.
 - vi. There is no mention anywhere of any term or description that relates to this system applying the liquid for anything other than burning.
- c. Re: Paragraph (f): "moveable diaphragm or piston"
- i. The action refers to item 14, which is visible in most of the illustrations and is described in Col. 3, Line 38 as a "pusher plate". It's actual function is described in Col 3, Line30 through Col 4, Lines 1-16.
It is movable, as asserted, but, as is described in the above-referenced specification text, it is moved, as liquid fuel is pumped in from an

external source of pressurized fuel, to open a cavity for storage of fuel for later use.

- ii. Then, upon ignition, it provides only “regenerative” (Col 4, Lines 52-53) pressure to the chamber, i.e. a small amount (since the friction-based source force, unlike the current invention, mechanically reduces (the current invention increases) rather than mechanically increases the velocity of the projectile – thus it is taught to be minimal).
- iii. The chamber pressure is not only minimal but taught as the antithesis of the current invention’s rapid energy conversion upon impact. This is a fuel injector, all of which apply some force to move the liquid through a path to the combustion.
- iv. This paragraph could be belabored but it should not be necessary since Col. 4, Lines 38-53 so clearly describe both the kind of pressure and purpose as it’s applied as a simple pump to move fuel in a regenerative (continuously as the fuel needs to be replaced due) process to transport it to a combustion area).

d. Re: Paragraph (g): “fluid explosive in the compression chamber”

- i. First of all, Ashley does not provide a “fluid explosive in the compression chamber”. The compression chamber, if it is to be called that (it is not for the purpose of accumulating a high compression but simply surviving in the presence of a low compression as fuel passes through), is for the purpose of externalizing the fluid from that chamber into a separate combustion chamber “aft of the injection plate” (Col 4, Lines 17-20)..
- ii. Ashley does not call it a “compression chamber” since Ashley’s chamber is more of a bladder for expending the liquid as needed. Ashley, in fact, acts in similar fashion and for the same purpose as an animal urinary bladder – to dispense its contents using relatively smooth, moderate external pressure (and, hopefully, away from good furniture).
- iii. The action identifies Col 3, Lines 32-35 as the text in Ashley’s specification that describes a “fluid explosive in a compression chamber”. However, this text clearly describes it as a fuel pump – literally a “liquid propellant pumping system” which “will fill the round with propellant before firing”. Upon ignition, it will move the fluid to another, separate area, where accelerating compression will be completed not by the liquid pushing the back of the projectile but by burning the liquid. There is nothing in this text that would make the current invention’s velocity multiplying energy conversion upon sabot-collision seem more obvious.

e. Since Ashley has no anchored means for safe removal of the sabot, the action appeals to Malter. However:

- i. Malter is an add-on adaptor designed to make or convert an ordinary rifle to be sabot-ready and claims to reduce recoil and is a completely different animal from both the current invention and Ashley. It removes a sabot essentially the same way a drive-up window removes a car's rear view mirror that got too close – except that (unlike the rear view mirror which at least has the decency to stay with the car -- hanging on by the defroster and attitude control wires) the Malter sabot continues on in a trajectory below that of the projectile's to potentially maim or kill those below the intended target.
- ii. Malter does not safely capture (or even contain at all) the sabot except that the sabot has a lower and shorter trajectory.
- iii. All that wiggles is not Jello and all that slows sabots is not the current invention.
Malter is one of many things that slows sabots (like the numerous wind-based separation processes). That inconsequential cosmetic withstanding, it does not perform the functions for which the slowing is intended and profitably applied in the current invention.
It is not part of a velocity multiplication assembly or process and, in fact, works in the opposite direction and is anything but “an analogous art setting”. (Malter's components, in toto, do not increase the velocity but reduce it slightly.
- iv. All of the acceleration is achieved not in the Malter equipment itself but in the rifle prior to the attached Malter invention.)

You can tack Malter onto Ashley but all you have then is a fuel-injected sabot with differently shaped shrapnel for the entertainment of bystanders.

- v. The current invention, in addition to substantially increasing the projectile velocity (an important factor), has, inherent in its configuration options, the capacity to safely and completely contain, not just make a reduction in velocity, the entire sabot without endangering others.
- vi. The current invention's sabots are undamaged and reusable. The processes Malter teaches and any that it might anticipate leave a sabot on the ground (ideally) for every round. Alternatively, the current invention allows the reuse of sabots and the minimization of transport and supply overhead in military theatres.
- vii. In terms of obviousness, it would be difficult to imagine how looking at Malter's rear-view mirror remover would make anyone, come to an

obvious conclusion of the not-even-remotely-similar process of the current invention which is a benefit of a new assembly that has a completely different function, acceleration, and different parts.

- f. Jakobsson is another retrofit device to tack onto an existing gun to allow it to fire sabots. It adds a spring to Malter's remover to bounce it aft and out. While this is not a slowing process but, instead, completely reverses the velocity and leaves the sabot flying, it, ostensibly at least, might do so in a safer manner. Also, it is not a part of a velocity multiplier and, like all the others above, at separation will have, to a small degree, the exact opposite effect, i.e. it will slow rather than accelerate the projectile.

The action says that "Applicant is substituting one means to remove the carrier from the projectile for another in an analogous art setting." However, no combination of any of the above prior art examples will perform the functions of the current invention. If you, for example, substitute Jakobsson for the current invention's impact and energy conversion component, you will have neither the energy conversion of the current invention nor the direct application of that energy to substantially increase the velocity of the already rapidly moving projectile. As to the "analogous art setting", none of the prior art above could be referred to even as additive projectile accelerators (after the initial acceleration) both because that is not their function and it certainly is not the result (they reduce the velocity due to separation overhead).

- i. Also, Applicant has made no mention of the matter above but, in all the earlier prior art above, and here as well, the action has positioned the sabot control as having only a fraction of its commutual components and purpose. This seems almost as incomplete as positioning the first computer as something with a button on it and then suggesting that there are lots of things with buttons on them including party dresses (which were prior art). The straw man in the action was not quite that extreme. However, it did create an easily knocked-down definition of a key part of the current invention (that converts the sabot's kinetic energy into additive, highly leveraged acceleration to the projectile and, oh by the way, in the process of transferring its energy, the sabot slows or stops) simply as:

"an effectively anchored apparatus to reduce the speed of the projectile carrier".

"a leveraging means"

However, the claim, which directly reflected the specification (not a brake), actually said:

"an effectively anchored apparatus to encounter and effectively stop or substantially reduce the speed of the moving projectile carrier with said apparatus having an opening or otherwise

unblocked path to allow the largely unrestrained projectile to continue in its path past said apparatus; and

a leveraging means placed in or being part of the projectile's movable carrier for receiving, as the carrier impacts the anchored apparatus, the energy of that impact and transmitting that energy in leveraged form through the leveraging means to the rear of the projectile"

Its easy, of course, (if you just limit it to all things that slow down sabots) to find lots of things that slow down sabots (even barrel friction as the action attributes to Abels further below) but this sabot velocity reduction is a symptom not the cause – and certainly not the purpose. And, of course, Jakobsson, even in combination with any or all of the above, has no leverage component to multiply the velocity of the projectile.

- g. Thus, Ashley and Russel, the 2 fuel injectors, having no key components in common with the current invention except that they both use guns to shoot sabot projectiles and have a liquid somewhere on board, have no obvious similarities that would cause someone skilled in the art (even with Jakobsson in mind) to say "why don't I forget about all this fuel injection assembly for long-path jet action throughout the length of the barrel, change every single part except the sliding surfaces and initial charge to perform completely different functions, and then add a leveraged, impact-based velocity multiplier that operates in a completely different fashion?"

Because they serve separate functions different ways, Ashley and Russell in some combination, even if Malter and Jakobsson were brought in to help, would require quantum leaps of hindsight since the elements for foresight are not there.

- 11. Abels is not a compression-leveraged velocity multiplication system nor does it provide sabot containment. Instead, the embodiment considered in the action is clearly a simple multi-stage fused projectile with no hydraulics or any other kind of leverage going on.

Further, Applicant volunteers that all sabots have (a) a projectile, (b) a projectile carrier, and (c) an (initial) acceleration means. However:

- a. Re: paragraph (c): Abels has only the primary acceleration means and nothing resembling the fully additive, potentially multiplicative complementary velocity acceleration at the muzzle. There is nothing in Abels to indicate that a secondary velocity jump at the muzzle or any one of the components that makes that possible was in any way anticipated.

- b. Re: Paragraph (d): “an effectively anchored apparatus to reduce the speed of the projectile carrier”.
- Drawing elements 11 and 5 were indicated in the action as the elements performing that function. It could be argued that the barrel (5) and the annular contact surface on the casing (11) slow the carrier down because some friction exists. However, it doesn’t relate to the current invention (please see the multiple discussions above regarding the difference between “any process that happens to slow down a sabot” and the key elements of the current invention). Abels’ friction at contact points does not anticipate the current invention.
- c. Re: Paragraph (e): “leveraging means”. The action indicates that drawing elements 13’, 19, and 18 effect some kind of leveraging means. They are not. This is simply a multi-stage sabot.

13’ is not a leverage device but is, instead, a powder charge (the “first additional drive load”).

19’ is not a leverage device but is just a powder charge (the “2nd additional drive load”).

18 is not a lever but is the sabot itself.

- d. Re: Paragraph (f): “a moveable diaphragm or piston”.
- Here, again, the criteria for comparison ensures that many comparable prior devices comply but this criteria ignores the action, purpose, and design of the components.

The action mentions in (f) only:
“a moveable diaphragm or piston”

However, the claim language, supported by the specification requires:
” The leveraging means is hydraulic having a movable diaphragm or piston which impacts the anchored apparatus thus transmitting the energy as compression within a nearby chamber whose outlet impacts the rear of the projectile.”

Though the German word for the drawing element #18 does translate to “piston”, it is only in the sense of a smooth sided moving container. In other words, 18 is a sabot. This piston does not even indirectly relate to the current invention any more than any other smooth-sided projectile.

It also does not compress anything into a chamber.

Nor is there any nearby chamber in which to compress anything (the piston moves towards ambient air, not towards a compression wall).

- e. Re: Paragraph (g): “an explosive in the compression chamber”.
- The above snippet used in the action to identify an element of the claims isn’t

from the claims in question, ignores the actual claim (and specification) criteria, and, unfortunately, becomes a straw man that is easily compared to just about anything that explodes.

Since claim 13 is the only claim at issue regarding Abels (the only one of them with an explosive charge), it is copied below along with 12 which it continues:

”12. The device of claim 11 wherein:

The leveraging means is hydraulic having a movable diaphragm or piston which impacts the anchored apparatus thus transmitting the energy as compression within a nearby chamber whose outlet impacts the rear of the projectile.

13. (new) the device of claim 12 wherein:

the fluid, gel, gas, or other medium inside the compression chamber is an explosive whose ignition is the result of the impact, or any other form of ignition, or any combination thereof; whereby additional propulsion is achieved.”

- f. This is very far from anything Abels. (Abels, as referenced, is a 3 stage powder load bullet.)
- g. It has nothing hydraulic (see 12 and 13)..
- h. The movable piston is not a compression piston but a sabot.
- i. The piston does not “impact the anchored apparatus” (actually, it impacts nothing until it hits its unfortunate target).
- j. It does not transmit energy as compression to a compression chamber because there is none in the direction it is going.
- k. There is no explosive for the piston to hit.
- l. There is no pressure-caused ignition.
- m. There is certainly no impact-created projectile velocity multiplication.

12. Others:

- a. Charpentier was not relied upon but will be addressed briefly:
 - i. Charpentier is a lab hypervelocity accelerator used to hit targets a few feet away with tiny projectiles (Col. 1, Line 22) (often like tiny shot) to model and test the penetration curves of velocity vs. mass. It’s design and technique is useful for such testing. However, it has only worked with tiny projectiles under these conditions. Over 35 years of adaptations on this theme still have not made this lab accelerator practical in the field – thus you see something like them in labs (in

modified embodiments like additive fore-based vacuums, modified collisions, and sans the carrier crushing) but never on the battlefield.

- ii. Charpentier has 2 projectiles, unlike the current invention's one, that must be used in sequence in a complex process that, in a laboratory, is effective.
- iii. The tiny size of the projectile is ideal for Charpentier's design. However Charpentier is not well suited for field operation with heavy projectiles and sabots.
- iv. Instead of a machineable hydraulic piston, as in the current invention, Charpentier uses a form of hydraulics more like the squeezing of a toothpaste tube.
- v. Heavy-duty sabots that carry larger payloads (and survive their acceleration) have heavier walls that and, in turn, don't make good toothpaste tubes.
- vi. While the current invention creates a true mechanical advantage (literally a piston-diameter/projectile base diameter predicted leverage) hydraulic, Charpentier effectively slams the toothpaste tube into a funnel. Deformations in the crushed carrier vary and the net pressure with it.
- vii. Further, there are many "faces" at the wall-fluid boundary with different areas, directional vectors, units of force, and a varying impact cushion driven by the crushing characteristics of each projectile (not a single smooth piston as in the current invention) thus the net pressure is not only less predictable, but it also changes as the crushing of the carrier progresses (unlike the current invention).
- viii. Charpentier's different design is less efficient because it is a different hydraulic animal. Charpentier creates numerous opposing forces from its multiple boundary faces (facing in different directions assuring less efficient and significantly counter-effecting forces) created in the crushing process. The efficiency of the current invention's unified conversion of all force into directly usable single-face (piston) hydraulics (no destructive interference / cross hydraulics) is absent in Charpentier.

Also, Charpentier loses both energy in the crushing process and loses the potentially "square wave" acceleration of the current invention applicable to maximizing velocity. This is not as big a problem in a laboratory where a very large and heavy assembly is expected but its failings become apparent when leaving the lab.

- ix. Charpentier's design and method is both less accurate directionally and provides a less dependable range. Though Charpentier's

toothpaste tube-like compression works very well at close ranges, its randomly affected fluid perturbations can vary the net vector slightly as well as, due to the less precise overall pressure and changing pressure as the crushing continues, the range. This is, however, not an issue in the laboratory where the target is right in front of the muzzle, the environment that Charpentier's unique design was created for. However, for a target potentially miles away...

- x. Charpentier's process, unlike the completely different and superior current invention, is a self-destructing process (for the sabot – which is both expensive and more difficult to resupply in the field) while the current invention is a repeatably useful true hydraulic.
- xi. Non-adjustable range. The current invention, having a predictable, controllable, true hydraulic process can have its distance/range accurately adjusted in the field. Charpentier is not similarly designed to be useful outside the lab to hit a target at ad-hoc ranges.
- xii. Charpentier does not teach the current invention.
- b. Wallow is another multi-stage weapon with no similarities to the current invention that it does not also share with most traditional sabots (i.e. having a charge and a sabot). Its claim to fame is that it gets right up to the target and fires the second stage. This does not anticipate the current invention.
- c. Cuadros is a powder-charge inflated and propelled non-lethal weapon. It is handy to have in a dark alley or during in-law visits but does not teach the current invention.
- d. Societe Brevets describes another 2 stage process but does not teach any of the key components (i.e. those beyond the basic sabot portion) of the current invention.
- e. Rooney 1 and 2 are both very early simple sabot designs with wind separation. They do not teach the current invention.
- f. Desevaux describes another sabot, this one with improved guidance features in projectile handling but does not teach any of the key components (i.e. any of those beyond the basic sabot portion) of the current invention.
- g. Costello is an expandable sabot (in flight) with a separate stage for that function adding velocity by the late stage. However, it does not teach any of the key components (i.e. any of those beyond the basic sabot portion) of the current invention.

Applicant is not an attorney and has not retained one (and really wishes he could afford one right about now). However, in a computer search on obviousness criteria, *Graham v. John Deere, Co*, 383 U.S. 1 (1966) was found. There the court ruled that the obviousness inquiry is highly fact specific requiring that the following be closely examined:

1. The content and scope of the specific prior art claimed.
The content and scope of the listed prior art, as outlined and addressed above (probably in an overboard manner for which apology is made), neither teach the components nor the functions of the current invention. And..
2. The differences between the patented invention between the current invention and the prior art that already existed.
Those differences, many listed in all the paragraphs above, are both numerous and inclusive.
3. The ordinary skill of people working in the field.
As admitted, Applicant is no attorney but has worked as an engineer for many years and, from that experience further admits that skilled engineers can have epiphanies with no stimulus at all. However, without that by-definition, non-obvious epiphany, it is completely unrealistic to give ordinary engineers with no knowledge of the current invention or understanding thereof, pictures and descriptions of the prior art discussed above and then expect them to come up with the current invention that is so far removed in so many ways and even performs completely different functions addressed to serve different needs.
4. Other objective evidence suggesting that the invention would not have been obvious.
One thing that all of the prior art discussed above have in common is that, to the knowledge of the Applicant who has done rather extensive research in the area, they are not used on any battlefield in the world. Also, the current sabot solution that is used for the most difficult penetration applications, based largely on the density of depleted uranium, though widely used, is hazardous to both our military and anyone passing by later.

The court further warned the lower courts that they “guard against slipping into use of hindsight” and to “resist the temptation to read into the prior art the teachings of the invention in issue”. There are, particularly when looking at summary line drawings, numerous cosmetic similarities between things with vastly different mechanisms (ex: a mushroom vs. nuclear fusion). Thinking of the current invention, one can find many shapes and even known off-the-shelf sub-components that could be used to be put together into such a device. However, this is with the benefit of hindsight and using drawings of items with different structural design, purpose, operating steps, and end result.

Other applicable rulings (ex: *Ashland Oil, Co. v. Delta Resins and refractories, Inc.*, 776 F.2d 281, 291 (Fed. Cir. 1985), cert. Denied 475 U.S. 1017 (1986).

Also, based on what research Applicant has been able to do, it is believed that a prima facie case of obviousness has not been made and that, to do that under 35 U.S.C. 103(a) all of 3 requirements must be met.

1. The reference or references, taken alone or in combination, must teach or suggest each and every element recited in the claims.

An example from the list above, the current invention's hydraulic means (those "means" described in the specification including a piston creating high, efficient compression in a compression chamber where the fluid therein pushes against the projectile to further accelerate the moving projectile) is neither suggested nor taught in the prior art. Additionally...

2. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention.

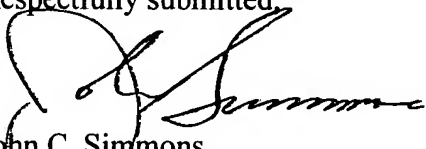
These motivations or suggestions are not known and have not been presented.

3. A reasonable expectation of success must exist.

However, a reasonable expectation of success does not exist in the combination of the cited art. The components, even where cosmetic similarities do exist, do not, in any combined form, create a workable device nor will simple tweaking of the components which have drastically different functions and designs take all of them combined into the current invention.

Applicant respectfully requests that these responsively revised claims be accepted.

Respectfully submitted,



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Listing of Claims:

1-9 (Cancelled)

10. (withdrawn) A device for accelerating the speed of a projectile consisting of:

a projectile; and

a carrier for carrying the projectile; and

an acceleration means to move the projectile and its carrier effectively together; and

an effectively anchored apparatus to encounter and effectively stop or substantially reduce the speed of the moving projectile carrier with said apparatus having an opening or otherwise unblocked path to allow the largely unrestrained projectile to continue in its path past said apparatus; and

a leveraging means, as part of or operatively connected to the anchored apparatus, positioned to receive the energy of the carrier and transmit it through a lever or set of levers to the rear of the projectile; whereby

the already moving projectile is further accelerated.

11 (currently amended) A device for accelerating ~~the speed of~~ a projectile consisting of:

a projectile; and

a carrier for carrying the projectile; and

an acceleration means to move the projectile and its carrier effectively together; and

an effectively anchored apparatus to encounter ~~and effectively stop or substantially reduce the speed of~~ the moving projectile carrier with said apparatus having an ~~opening or otherwise~~ unblocked path to allow the largely unrestrained projectile to continue in its path past said apparatus; and

a leveraging hydraulic means ~~placed in or being part of the projectile's movable carrier~~ for receiving, as the carrier impacts the anchored apparatus, the energy of that impact and transmitting that energy ~~in leveraged form~~ through the leveraging hydraulic means to the rear of the projectile; whereby

the already moving projectile is further accelerated.

12. (withdrawn) The device of claim 11 wherein:

The leveraging means is hydraulic having a movable diaphragm or piston which impacts the anchored apparatus thus transmitting the energy as compression within a nearby chamber whose outlet impacts the rear of the projectile.

13. (currently amended) ~~†~~The device of claim ~~12~~ 11 wherein:

~~the fluid, gel, gas, or other medium inside the compression chamber~~
content of the hydraulic means is an explosive whose ignition is the result of the impact,
~~or any other form of ignition, or any combination thereof~~; whereby additional propulsion is achieved.

14. (withdrawn) The device of claim 11 further comprising:

a sealed area in advance of the projectile's path for containing a vacuum; and

vacuum creation means, powered by the same sudden or explosive acceleration that

initially propels the projectile and carrier, with a resulting pressure occurring in a first chamber equipped with a first sealed plunger or diaphragm which moves in response to the expansion and which is operatively connected to a second sealed plunger or diaphragm in a second chamber such that, as the second plunger or diaphragm moves through the second chamber, a vacuum is drawn in the second chamber; and

a sealed cover for the aforementioned sealed second chamber which is either penetrable, breakable or removable for the advancing projectile such that the vacuum created in the area in advance of the projectile is allowed to accumulate until it is time for the projectile to exit; whereby

air resistance is reduced in advance of the projectile facilitating less restrained acceleration.

15. (previously presented) A method for accelerating a projectile comprising the steps of:

- (a) accelerating a projectile and carrier together,
- (b) slowing or stopping the carrier by an encounter with a restrictive contact element located essentially in the path of the oncoming carrier,
- (c) conducting the carrier's kinetic energy from the restrictive contact element through a leveraging device,
- (d) pushing the back or trailing end of the projectile from the faster moving portion of the leveraging device, and
- (e) adding more velocity to the already moving projectile.

16. (new) the device of claim 12 wherein:

the medium inside the compression chamber is an explosive and is ignited when as the projectile reaches the muzzle; whereby additional propulsion is achieved.

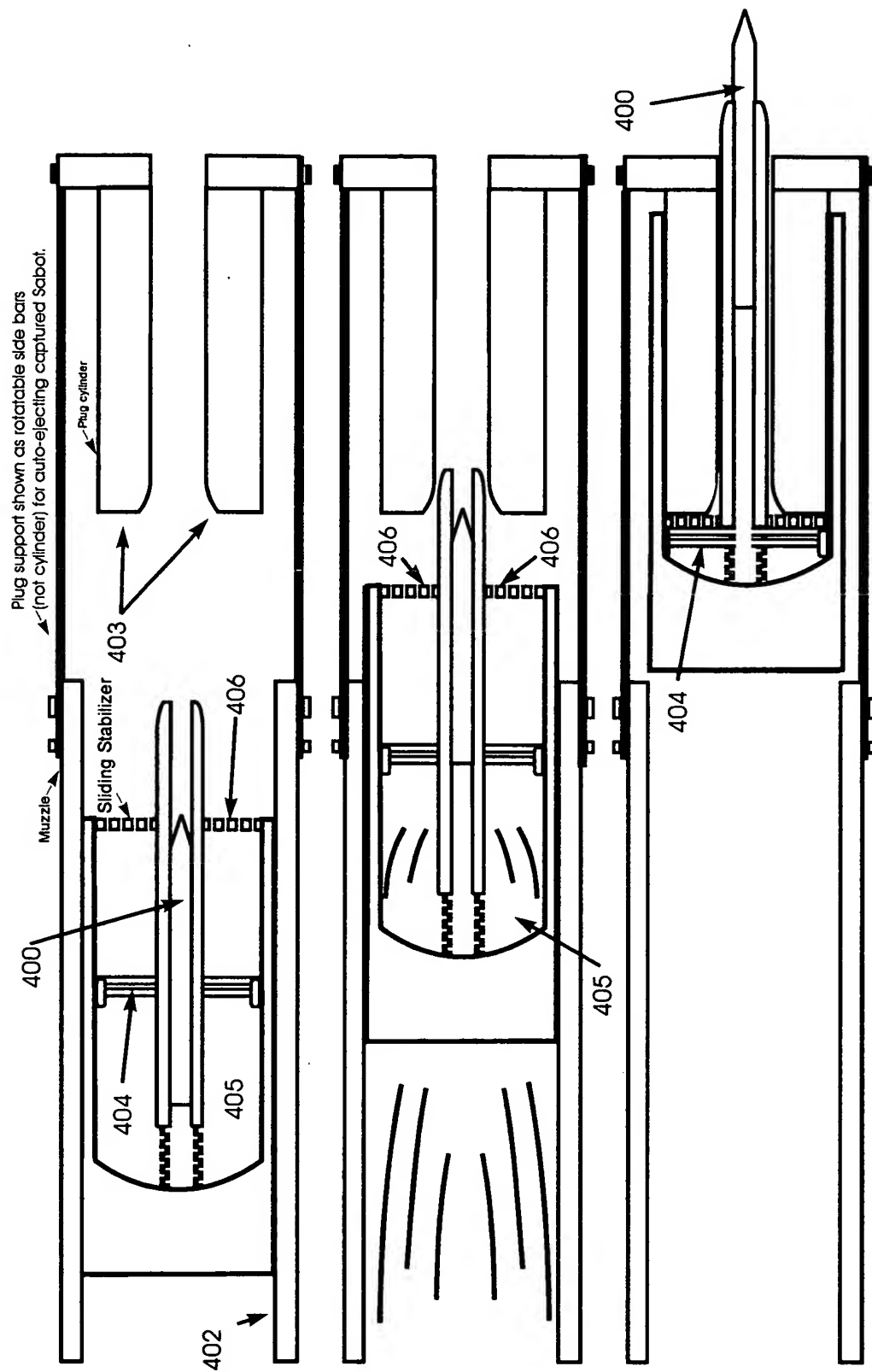


Fig. 4A

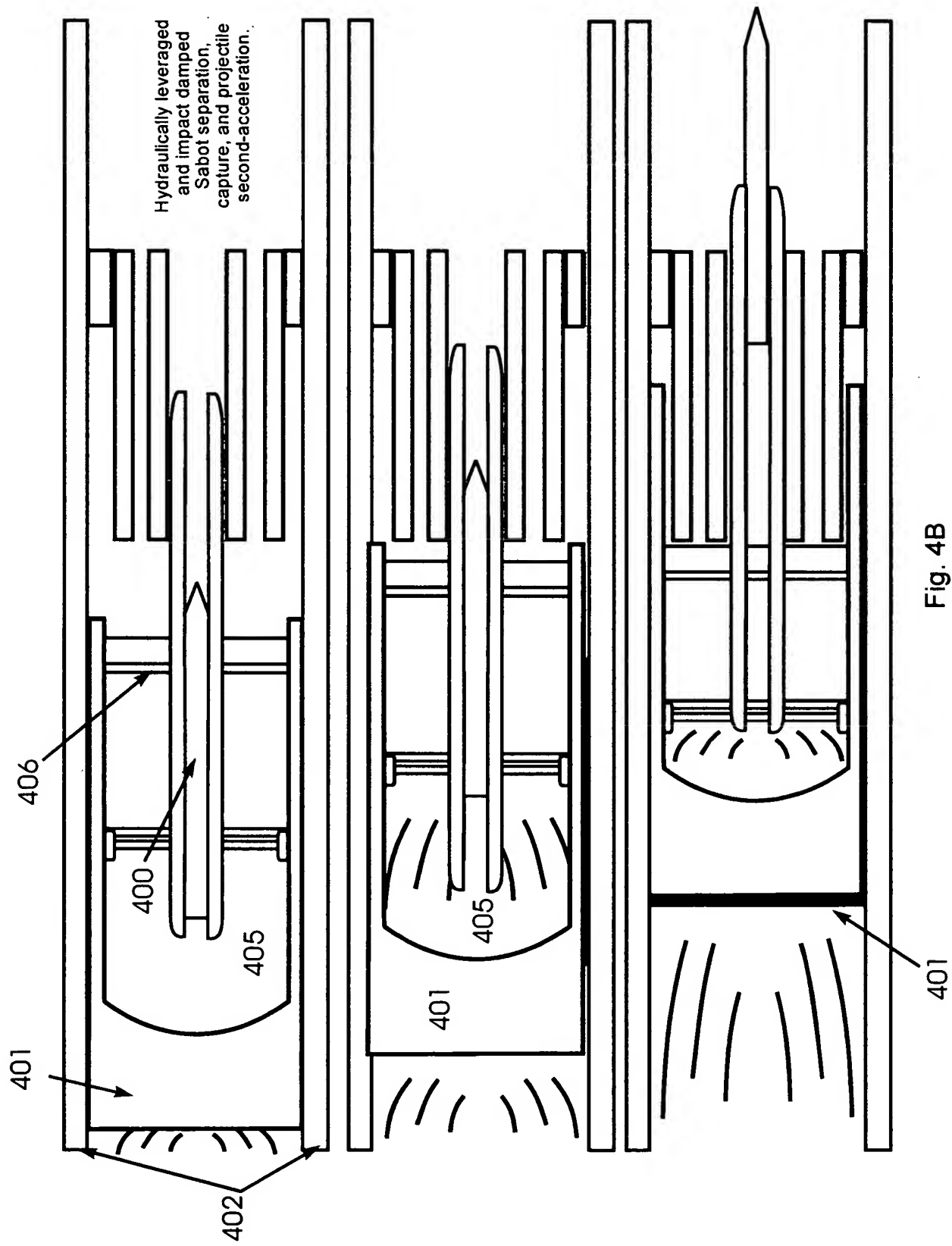


Fig. 4B

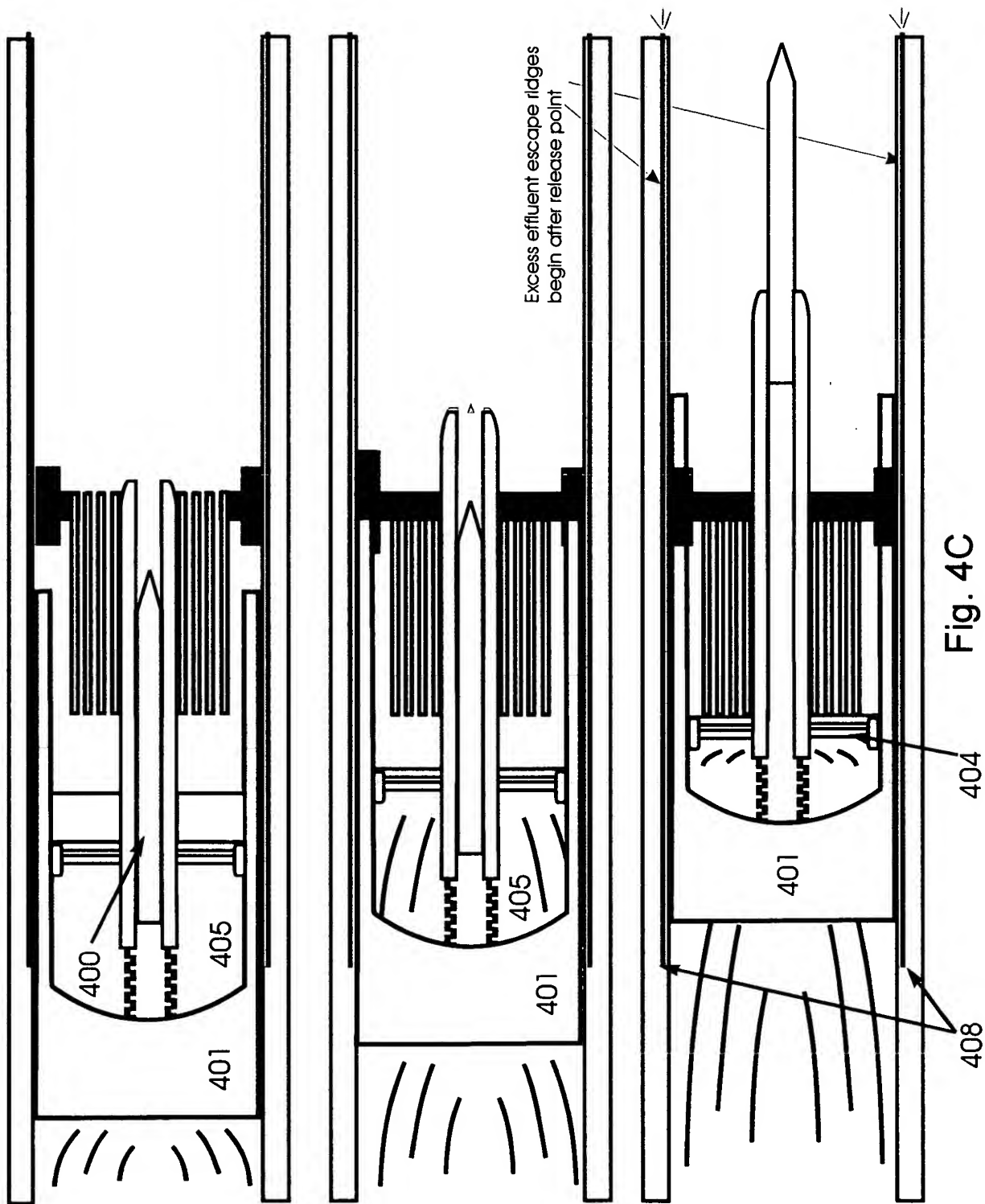


Fig. 4C

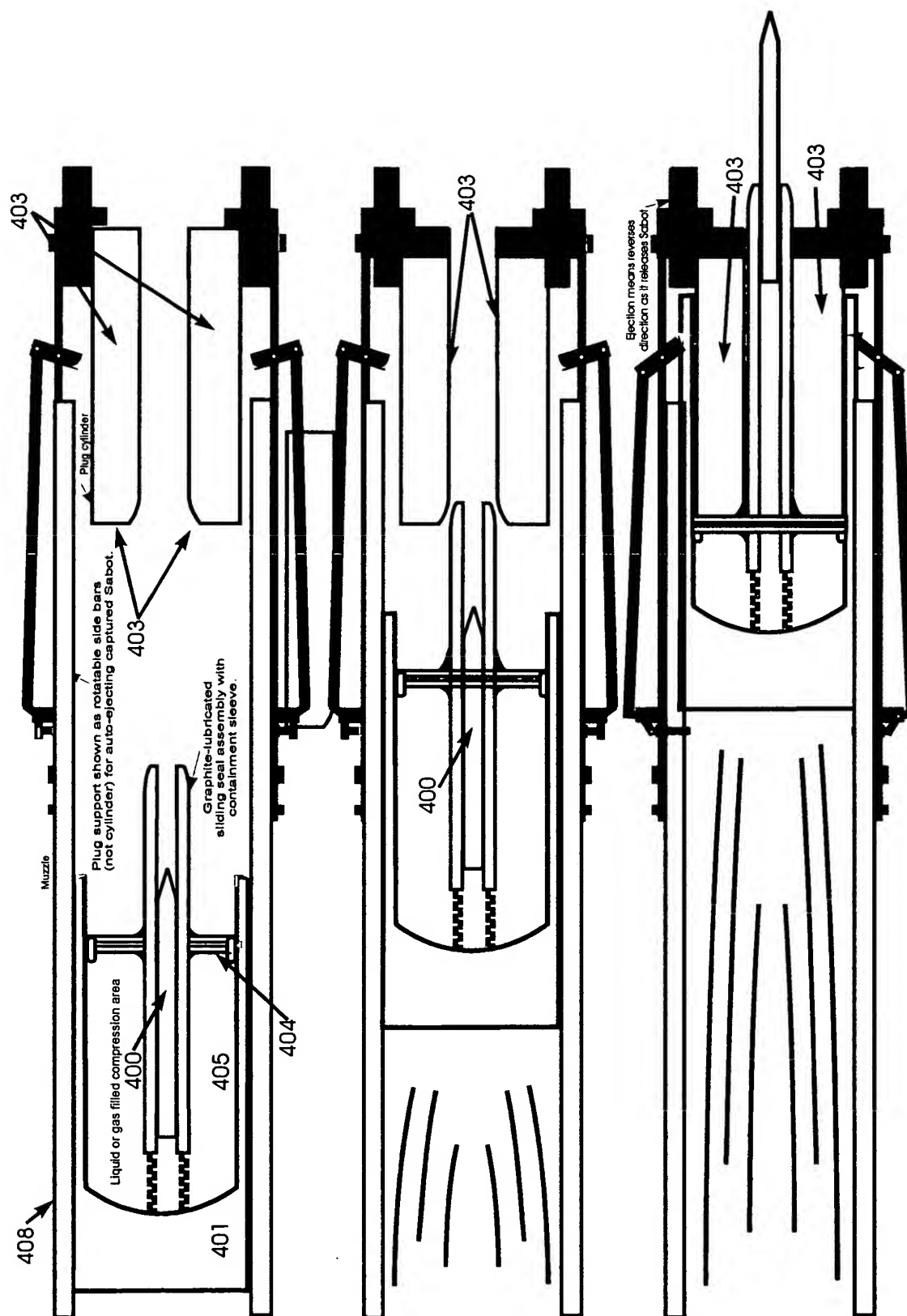


Fig. 4D

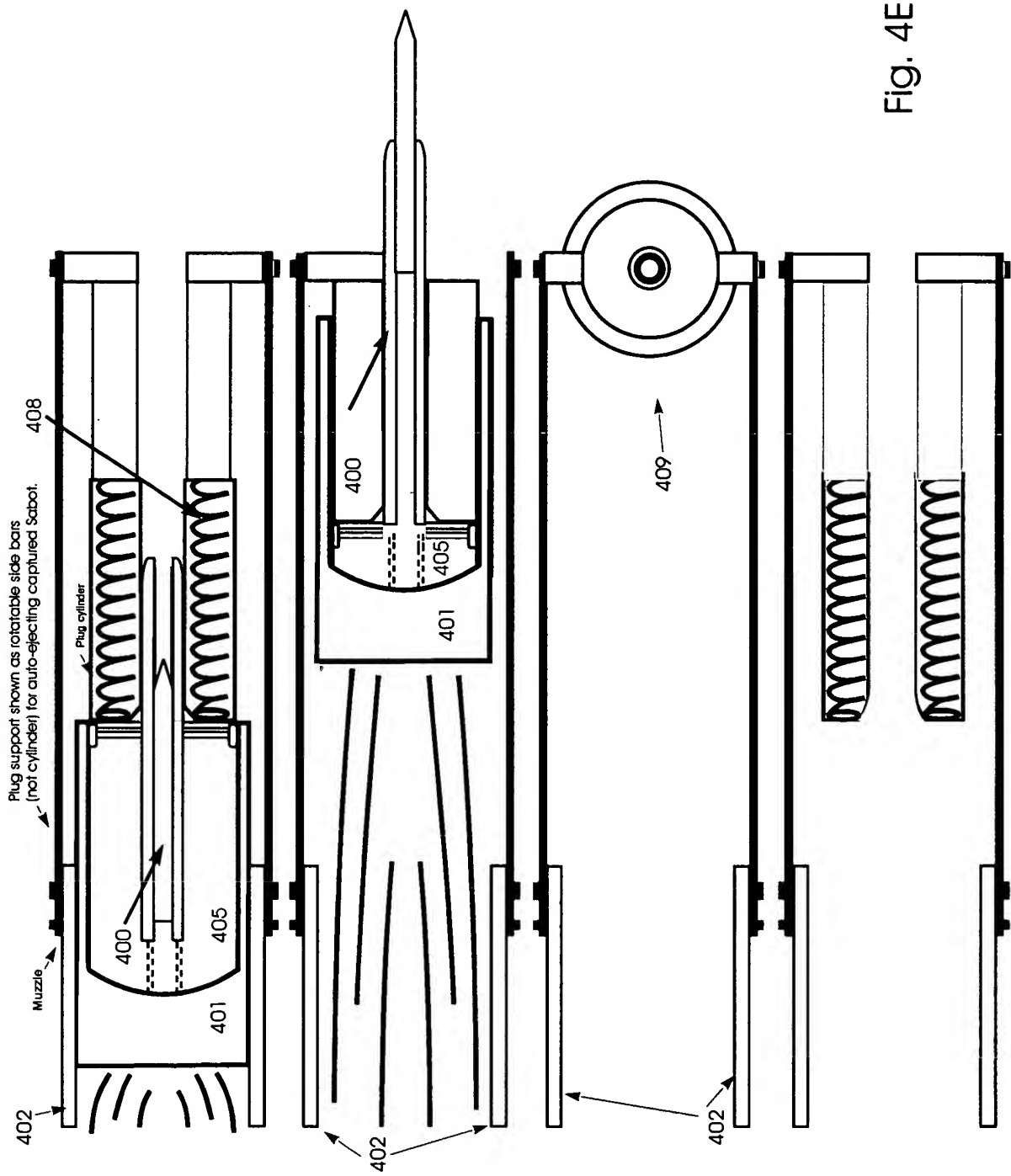


Fig. 4E